

Appl. No.: 10/029,612
Response dated June 29, 2005
Reply to Office action of March 29, 2005

Remarks

Claims 1-9 are currently pending in this application.

Applicants respectfully request that the amendment be entered into the specification. The amendment to the specification is of an editorial nature to correct a typographical error which occurred during preparation of the application. Applicants respectfully submit that no new matter has been entered by way of amendment to the specification.

Before discussing the rejections over the prior art, Applicants deem it prudent to set forth what they consider to be their invention. Applicants' invention is directed to a stable, flowable, pourable and pumpable concentrate of a hydroxy aryl oxime metal extractant in a water-immiscible hydrocarbon solution. The invention comprises either preparing a combination of the concentrate in a container having a volume of from about 250 liters up to 50,000 liters, or the method by which the combination of the concentrate and container is prepared. The concentrate contains from about 55 to 85% by weight of the hydroxy aryl oxime metal extractant. In a preferred embodiment, the concentrate contains from about 62 to about 85% by weight of the hydroxy aryl oxime metal extractant.

The invention is based on the unexpected discovery that within certain ranges of concentrate viscosities and temperatures, the concentrate is stable to uncontrolled autocatalytic degradation (a known problem with the hydroxyl aryl ketoximes and aldioximes).

After a series of studies of the effect of dilution with the hydrocarbon solvent on the viscosity of the concentrate and the temperature of no return (T_{nr}), the temperature for a given container at which the autocatalytic degradation cannot be controlled. The T_{nr} temperature is related to the viscosity of the concentrate and the size of the container.

Appl. No.: 10/029,612
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Prior to the present invention, concentrates were maintained at a relatively low content of the hydroxyl aryl aldoximes and ketoximes and the maximum size of the containers were generally about 200 liters.

Even though large containers for liquid chemical products are well known in the art and can be easily attached to pumps and the like, no producer has ventured into shipping the concentrates in large containers due to the difficulty with the autocatalytic degradation of the product.

By studying the relationship between the viscosity, size of container and Tnr, Applicants have determine that certain products can be transported and stored in relative large container at concentrations as high as 85% by weight in the hydrocarbon solvent.

The experimental data shown at Table 1 (page 20) and Table 3 at page 26 clearly shows the relationship between the concentration, viscosity and Tnr.

Applicants admit that large containers for transporting liquid chemicals have been known for many years. The containers have been developed for more efficient transport utilization of chemicals and environmental concerns in regard to disposing of small containers and the cost thereof. However, no manufacturer or distributor has shipped concentrated solutions of hydroxyl aryl ketoximes and aldoximes as concentrated solutions in containers larger than about 200 liters (55 gallons). The materials were shipped in small containers in spite of the known advantages utilizing large containers for large shipments and the difficulty in introducing the concentrate into the manufacturing process from small containers.

Applicants submit that the fact that the large containers for liquid chemicals have been available for a substantial length of time, and that no manufacturer or distributor has shipped the hydroxyl aryl aldoximes and ketoximes as a concentrated solution in a large container, Applicants submit that the present invention is not obvious over the teachings of the prior art.

Appl. No.: 10/029,612
Response dated June 29, 2005
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Claims 1-3 and 5-7 stand rejected under 35 U.S.C. 103(a) as unpatentable over Anderson et al. (US 4, 350,667) or Scher (US 4, 500,494) or Applicants' admission on page 4, line 31 - page 5, line 13, of the specification; or in view of Applicants' admission in a declaration filed under 37 CFR 1.132 on April 12, 2001 in the parent application of the present application.

Applicants respectfully acknowledge that solutions of the hydroxyl aryl ketoximes and aldoximes are known products, have been produced as solutions in hydrocarbon solvents and have been shipped in relatively small containers at concentrations up to 70% by weight depending upon the particular ketoxime or aldoxime in the hydrocarbon solvent.

Scher discloses microcapsules containing a solution of the chelating agents in a hydrocarbon solvent. The concentration of the chelating agent in the solvent is within the range of 5% to about 70% by weight. Applicants submit that Scher would not be concerned with the autocatalytic degradation since the solution of the chelating agent in the hydrocarbon solvent is in a microcapsule. One skilled in the art would clearly recognize that the microcapsule surface would interfere with the autocatalytic degradation of the aldoximes and ketoximes. That is, it is well-known in the art that extended surfaces have an ameliorating effect on heat-generating reactions. That is, the extended surfaces tend to quench the heat-generating reactions since the surface of the microcapsule is in intimate contact with the contents and the ratio of the surface to the content of the microcapsule is extremely large. The method of Scher would be another way of controlling the heat-generated by the autocatalytic degeneration of the chelating agents.

That is, Scher utilizes a container (microcapsule) having an extremely large surface to volume ratio. In contrast to the teachings of Scher, the present invention utilizes containers for the mixture having a relatively small (in relation to microcapsules) ratio of the surface to the volume of the container.

Appl. No.: 10/029,612
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The Examiner indicates that it is well known in the art that solutions of the ketoximes and aldoximes in the hydrocarbon solvent have been shipped in containers as large as about 200 liters. However, Applicants submit that the large 1,000 liter and 20,000 liters containers, which are well-known in the art have never been utilized to transport the liquid solutions of the chelating agents in the hydrocarbon solvent. This has not been done prior to the present invention even though there are substantial economic and environmental reasons for using such large containers.

Applicants have discovered a relationship between the concentration of the chelating agent, the viscosity of the solution and the Tnr of the composition. Applicants have determined that the size of the container has a substantial effect on the Tnr and has through the relationship between the viscosity, concentration and Tnr been able to determine the maximum size of a container suitable for shipping a particular composition. Applicants have unexpectedly discovered that containers larger than 250 liters can be suitable for transporting the solutions of the chelating agents of the invention at substantially higher concentrations than were previously known to be safely shippable in the large or small containers.

Applicants have recognized a problem in the art and have been able to solve the problem by experimental methods used to find a relationship between the concentration of the chelating agent and the hydrocarbon solvent, the viscosity of the liquid composition and the Tnr. Applicants respectfully submit that the prior art cited by the Examiner, whether considered alone or in combination would neither teach nor suggest or present a prima facie case of obviousness for the invention claimed in claims 1-3 and 5-7. Applicants submit that the rejection is untenable and respectfully request that the rejection be reconsidered and withdrawn.

Claims 4 and 8-9 stand rejected under 35 U.S.C. 103(a) as unpatentable over Anderson et al. or Scher or Applicants' admission on page 4, line 31, to page 5, line 13, of the specification, and in view of Applicants' admission in the declaration filed April 12,

Appl. No.: 10/029,612
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2001, in the parent application. Additionally in view of Kordosky et al. Applicants respectfully submit that the references, whether considered alone or in combination, neither teach nor suggest the present invention.

Claims 5 and 8-9 are directed to solutions of specific chelating compositions at particular concentrations. Applicants submit that as discussed above, none of the references cited by the Examiner would lead one skilled in the art to determine the relationship between the concentration of the chelating agent, hydrocarbon solvent, the viscosity and the Tnr of the solution. Applicants do not understand whether any of the prior art references were concerned with the size of the container in which the maximum concentration of the chelating agent in the hydrocarbon solvent could be safely stored and shipped. However, Applicants are well familiar with the art and do not know of any efforts to ship and store the solutions of the chelating agent in the hydrocarbon solvent in containers larger than about 200 liters. The shipping and storage of the solutions of the chelating agents in the hydrocarbon solvents were done in relatively small containers having a large surface-to-volume ratio. No one in the art, despite the obvious advantages of utilization of large containers in view of the handling and environmental advantages therein, utilized containers in the range of 250 to 20,000 liters as disclosed and claimed in the present application. Applicants respectfully submit that the rejection is untenable and respectfully request that the rejection be reconsidered and withdrawn.

Respectfully submitted,



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